Text Contribution for P802.1Qdq

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Overview

- We have investigated the following comment and propose our remedy in this presentation.
 - Comment about neglecting $\boldsymbol{\epsilon}$
 - [802.1 14985] [Qdq] Some Thoughts on Equation (X-5)

[802.1 - 14985] [Qdq] Some Thoughts on Equation (X-5)

As indicated in one of my comments and discussed during comment resolution, (X-5) at this point does not give very good guidance to the user of this document. I have done some playing around and would want to hear your thoughts on it: I use the following nomenclature, trying to stay close to the document draft:

- B ... BlockData size (different from text)
 D ... DataSize (different from text!)
 n ... number of Frames per cluster

 (I stick with Frame for now, although I think Packet would be better to use!)

 F ... FrameLength
 RM ... RequiredMinimumShapingRate
 BL ... BoundedLatency
 AL ... AccumulatedLatency

[802.1 - 14985] [Qdq] Some Thoughts on Equation (X-5) (Cont.)

If we use

 $\begin{array}{l} \mathsf{D}=\mathsf{F}*\mathsf{n} \mbox{...} \mbox{(a simplification of (X-1)),} \\ \text{then Epsilon } (\epsilon) \mbox{ in (X-5) actually becomes:} \\ \epsilon=1/\mathsf{n}*\mathsf{F}/(\mathsf{BL}-\mathsf{AL}) \end{array}$

Quantifying the fragmentation overhead of line 3 page 24 as B ... fragmentation overhead per Frame we can expand: D = B + O * nand (X-5) can be expressed as: RM = (B + O * n)/(BL - AL) * (1 - 1/n)= (F * n)/(BL - AL) * (1 - 1/n)

If we look at (V-8) or (V-10) of IEEE Std 802.1Q-RevD1.0 or (6-1) of IEEE Std 802.1BA-2021, it is a good assumption that AccumulatedLatency in the network actually will depend on FrameLength, so you likely do not get to pick these parameters (F and n) independently (for a given B). Assuming AL was determined for a MaximumFrameSize FM, we get: D = (B + O * n) = FM * nand RM = (FM * n)/(BL - AL) * (1 - 1/n)

If we arbitrarily choose the error introduced by neglecting $\epsilon'=1/n$ to be: $\epsilon'<1\%$, then n>100 and therefore B>100* (FM – O)

Is it worthwhile to give this or a similar criterion to the reader?

Response to the commenter

- We agree with the commenter that there is the case ϵ is too large to be neglected.
- Application developers can take advantage that neglecting ε enables the whole of the BlockData to reach the Listener within the bounded latency regardless of the position of the reference points.
- Therefore, we define ϵ in detail and then transform Equation (X-4) to Equation (X-5) by using this definition.
- Since the derived variable "RequiredMinimumShapingRate" includes such kind of design decisions, the equations from Equation (X-9) onward are changed to equations using this variable.

• Change Page 27 Line 1 and 2 to:

Removed Added

DataSize(i) is much larger than the length of the last frame (i.e. FrameLength(iworst)), therefore RequiredMinimumShapingRate can be simplified by introducing a small positive value e as follows; Letting FrameLength(i_{worst} , $n_{i_{worst}}$)/(BoundedLatency - AccumlatedLatency) denote as ϵ , Equation (X-4) is transformed as follows;

• Change after Page 27 Line 4:

Removed Added

e can be zero in actual implementations.

Neglecting ε makes Requested MinimumShapingRate larger, therefore the reference of the last frame reaches earlier than configured by bounded latency. Especially, in order to neglect ε completely, that is, as zero, In case that an application developer requests to assure bounded latency until the last bit of BlockData delivers, consider the (n+1)th frame and its reference point that are imaginary.

• Insert after Page 27 Line 10 (Equation X-6)

Equation (X-6) is equivalent to Equation (X-5) where ε is zero. This enables the whole of the BlockData to reach the Listener within the bounded latency regardless of the position of the reference points.

X.4.3 Equation X-9

 $CommittedInformationRate = \frac{MaximumDataSize}{BoundedLatency - AccumulatedLatency}$ (X-9)

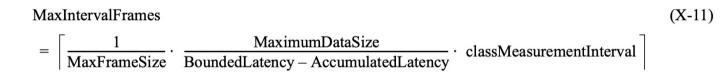
changes to

CommittedInformationRate = RequiredMinimumShapingRate

X.4.4 Equation from (X-10) to (X-13) includes fraction

MaximumDataSize BoundedLatency – AccumulatedLatency

for instance,



• This fraction is changed to "RequiredMinimumShapingRate"

Summary

- We answered the comment about neglecting ϵ .
- In some case, ε is too large to be neglected.
- On the other hand, neglecting ε has an advantage for application developers.
- Therefore, we defined ε properly and changed the related sentences and equations.